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ABSTRACT

A project was conducted to develop a comprehensive vocational education safety guide for local administrators and teachers. To generate the guide, the following steps were completed: (1) a review of key related research, literature, and federal and state legislation, including vocational safety guides from 18 states; reference material from the National Safety Council; relevant safety education materials identified through an ERIC search; and various state, local, and national agencies; (2) formation of an advisory committee composed of local administrators, Missouri State Department of Elementary and Secondary Education supervisors, representatives from the Occupational Safety, and University of Missouri-Columbia personnel; (3) identification of major areas of safety concerns common to all vocational education programs; (4) development of guidelines specific to each area; and (5) verification of all guidelines by Missouri educational leaders. Major sections of the guide included Missouri-specific laws, levels of responsibility, liability, safety program recommendations, facilities and equipment, personal protective equipment, and vocational special needs students. In addition, a reference listing of textbooks, articles, and state and national resource agencies was compiled as part of the guide. (The project needs assessment is included in the report.) (HN)

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FINAL REPORT

THE DEVELOPMENT OF A VOCATIONAL SAFETY GUIDE FOR MISSOURI'S PRACTITIONERS (RFP 81-131-600-8)

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ABSTRACT

The purpose of this project was to develop a comprehensive vocational education safety guide for local administrators and teachers. In developing this guide, the project team had as their overriding objective the goal of developing information that would be comprehensive enough to incorporate all aspects of vocational education and yet be feasible in terms of adaptability to any vocational program.

To generate the safety guide, a review of the key related research, literature and federal and state legislation was conducted. The literature review included existing vocational safety guides from eighteen states, reference material from the National Safety Council, relevant safety education materials identified through an ERIC search, and various other local, state and national agencies. An advisory committee composed of local administrators, Missouri State Department of Elementary and Secondary Education supervisors, representatives from NIOSH and OSHA, and University of Missouri-Columbia personnel also provided information and guidance in selection of material for this guide.

The purpose of the review was to identify compliance of requirements, outline major areas of vocational activity and to specify various data important to the safety of vocational students. Once such data was collected and analyzed, the guide was then developed. Major areas of safety concerns common to all vocational education programs were identified. Guidelines specific to each concern were then developed. The guidelines were verified by recognized vocational leaders throughout the state of Missouri as they served on the advisory committee for this project.

The guide as developed contains major sections on: Missouri specific laws, level of responsibilities, liability, safety program recommendation actions, facilities and equipment, personal protective equipment, and vocational special needs students. In addition, a reference listing of textbooks, articles and state and national resource agencies was compiled as part of the guide.

The following are some of the long-range benefits which can come from organized school accident-prevention programs developed from the guides:

1. Students will develop a safety consciousness including appropriate safety attitudes and judgements which they can take into their future field of employment.

2. Students will develop the ability to identify work-related risks and act accordingly.

3. Students will learn self-discipline and be able to understand and live with work-related authority.

4. Students will be prepared to cope with the obvious and presumed hazards in the work place, and business and industry will be assured of their basic capabilities in safe working.

5. Public tax money will be conserved through effective accident prevention programming.

6. Administrators and teachers will be more aware of their responsibilities and liabilities.

Although this safety guide was developed for the state of Missouri, it should be applicable in other states at all levels of vocational education and all types of institutions as well.

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THE DEVELOPMENT OF A VOCATIONAL SAFETY GUIDE FOR MISSOURI'S PRACTITIONERS

Statement of the Problem

The National Safety Council estimates that accidents cost this nation over $29,000,000,000 annually and that approximately $12,000,000,000 is due to work-related accidents. Some of the causes of accidents (conditions) that are contributing factors to the occurrence of accidents) which take place in vocational/technical laboratories are:

1. lack of knowledge.
2. poor work habits and attitudes.
3. unsafe behavior.
4. insufficient skill.
5. environmental hazards.

A major objective for vocational education is the development of safe work practices and safety awareness on the part of all vocational students. The personal recognition of the importance of safety encourages vocational educators to include safety practices and knowledge as an integral part of the instructional program. Safe working conditions in the school laboratory are a prime concern of students, teachers, and administrators. In compliance with the above needs, there is a need for development of a guide for vocational instructors and administrators in order to assist them in providing sound safety instruction as well as presenting descriptions of safe working and learning environments.

Objectives

Objective One: To establish and effectively use a highly qualified group of resource people knowledgeable in the areas of vocational education and safety.

This objective was met by establishing an advisory committee consisting of state department supervisors from each vocational service area represented, representatives from NIOSH and OSHA, local school administrators, University of Missouri-Columbia personnel, representatives from the state department's School Law section, and a representative from the State Department of Labor. The advisory committee monitored the progress of the research and reviewed the draft guide.

Objective Two: To conduct an assessment of the specific safety needs of Missouri's vocational education instructors.

A needs assessment was developed by the research staff and reviewed by the advisory committee. A pilot study was conducted to test the validity and reliability of the instrument. With the results of the pilot study and the input of the advisory committee, a final draft of the instrument was concluded. The assessment identified safety needs of Missouri practitioners

with respect to the most important safety categories and the relationships to key variables.

Objective Three: To prioritize extant needs.

Activities towards this objective involved the development of a safety guide with the following characteristics:

A. Meeting Missouri practitioners' needs

B. Encompassing all vocational education

C. Providing increased specificity over the existing Administrative Manual

Objective Four: To develop a systematic and phased plan for addressing these needs (both during this project period and beyond).

This objective provided a set of recommendations for addressing the safety needs of vocational educators. It is recommended that:

1. service area supervisors review the needs assessment data.

2. safety workshops be conducted across Missouri.

3. safety inspection of facilities be emphasized as part of vocational program evaluations.

Population and Sample

For objective one, the population consisted of all Missouri practitioners involved with the delivery of vocational education. Essentially this included administrators such as superintendents, principals, vocational directors, and occupational deans; and instructors in the service areas of Agricultural Education, Industrial Arts Education, Business and Office Education, Marketing and Distributive Education, Health Occupations Education, Trade and Industrial Education, and Home Economics Education.

Table I provides an overview of both population and sample characteristics. Service area sampling proportions are identified therein and an explanation of each column is provided as a continuation of the table.

Table II provides the service area response to the needs assessment. Each service area response is indicated regarding the number of instruments mailed, number of instruments returned, and the percent returned. The average return of 53% was deemed adequate and significant response variations were noted among service areas.

Table III provides information descriptive of the respondents' characteristics. In essence, these data depict a significant cross section of Missouri's vocational education practitioners.

TABLE I
NEEDS ASSESSMENT
Population and Sample

	SECONDARY					POSTSECONDARY					COMBINED				
Service area	Secondary teachers	Percent of total sample	Sample number (percent)	10% of population	Actual sample used	Postsecondary and adult teachers	Percent of total sample	Sample number (percent)	10% of population	Actual sample used	Service area totals	Percent of total sample	Sample number (percent)	10% of population	Total sample used
Ag Ed	268	.08	21	27	30	136	.05	7	14	30	404	.06	28	40	60
I Art	1250	.37	463	125	125	-	-	-	-	-	1250	.17	250	125	125
Bus/Of Ed	250	.07	18	25	60	580	.20	116	58	30	830	.11	109	83	90
Mktg/ DE	151	.05	8	15	30	227	.08	18	23	30	378	.05	23	38	60
Health Occ Ed	65	.02	2	7	30	404	.14	57	40	40	469	.06	38	47	70
T/I Ed	600	.18	108	60	60	1264	.45	569	126	54	1864	.26	559	186	114
Home Ec Ed	774	.23	178	77	75	227	.08	18	23	20	1001	.14	160	100	105
Supt											455	.06	27	46	79
Prin											511	.07	36	51	80
Voc Dir											50	.006	1	5	50
Occ Deans											12	.0017	1	1.2	12
TOTALS:	3358	100	798	336	410	2838	100	785	284	214	7224	100	1231	722.2	845

DESCRIPTION OF TABLE I'S COLUMNS

Service Area--identifies the population areas surveyed

Secondary teachers--indicates the number of secondary teachers within the service area

Percent of total sample--indicates the percent of the total secondary population which each service area represents

Sample number (percent)--represents the actual number indicated by the percent of total sample (Ag. Ed. 268 x .08 = 21)

10% of population--indicates 10% of the secondary teacher population

Actual sample used--indicates actual number of secondary teachers used as the sample for the study

Postsecondary and adult teachers--indicates the number of postsecondary and adult teachers within the service area

Percent of total sample--indicates the percent of the total postsecondary and adult population which each service area represents

Sample number (percent)--represents the actual number indicated by the percent of total sample (Ag. Ed. 136 x .05 = 7)

10% of population--indicates 10% of the postsecondary and adult teacher population

Actual sample used--indicates actual number of postsecondary and adult teachers used as the sample for the study

Service area totals--identifies the total population for each service area

Percent of total sample--indicates the percent of the total service area population which each service area represents

Sample number (percent)--represents the actual number indicated by the percent of total sample (Ag. Ed. 404 x .06 = 28)

10% of population--indicates 10% of the total population

Total sample used--indicates the total number from each service area used as the sample for the study

TABLE II
SERVICE AREA RESPONSE TO NEEDS ASSESSMENT

Service Area	Instruments Mailed	Instruments Returned	% Returned
Agricultural Education	60	52	87
Industrial Arts	125	62	50
Business & Office Ed.	90	34	38
Marketing & Dist. Ed.	60	23	38
Health Occupations Education	70	38	54
Trade & Ind. Ed.	114	64	56
Home Ec. Ed.	105	38	36
Superintendent	79	44	56
Principals	80	40	50
Vocational Directors	50	43	86
Occupational Deans	12	7	58
TOTALS	845	445	53%

TABLE III
RESPONDENTS' DESCRIPTIVE CHARACTERISTICS

Service Area	Highest Degree/ Certificate Held						Type of School/ Institution Working In					Amount of Experience		CPR Trng.		Red Cross Certified		Other Safety Training				Number of Accidents	
	Non-degree	Bachelor's	Specialist	Working Toward Degree	Master's	Doctorate	Middle/ Junior High	AVTS	Comprehensive High School	Junior/Comm. College	Other	Average Years Teaching Exper.	Average Years Work Experience	Yes	No	Yes	No	University	Military	In-service/ Workshops	None	Yes	No
Agricultural Education	0	25	0	1	24	0	0	9	42	0	0	9.7	5.8	17	34	2	49	11	6	7	26	13	38
Industrial Arts Education	0	22	1	2	32	1	11	1	40	0	3	11.2	5.1	27	32	3	56	8	5	7	38	18	41
Business/Offc. Education	1	10	2	1	18	1	1	3	24	1	4	7.1	5.3	8	25	2	31	3	1	0	29	0	32
Marketing & Distrib. Educ.	0	4	3	0	14	0	0	4	9	9	0	9.5	7.8	4	17	3	18	2	1	9	14	3	18
Health Occup. Education	12	12	1	5	6	0	0	23	3	10	0	7.3	11.4	35	1	16	19	6	0	12	12	5	31
Trade & Indus. Education	16	15	13	19	9	1	0	38	7	15	3	7.9	13.9	20	43	6	57	0	17	14	34	6	57
Home Economics Education	0	19	1	0	18	0	5	1	25	2	5	12.2	3.1	10	27	7	30	2	1	11	24	3	34
Administration	0	29	16	2	67	8	2	47	75	4	2	10.9	6.5	40	86	6	121	17	19	26	55	35	90

Conclusions and Deliverables

This project resulted more in a series of products than in a set of conclusions based upon data. However, there are a number of valid conclusions that may be drawn from the summary tables in this report. These include:

1. Of the summary variables, only personal needs and program needs correlated significantly.

2. 53% of return, N = 445, represents a representative sample of Missouri's vocational practitioners.

3. The majority of vocational educators reported they had no special training in safety other than as might be incorporated as a topic in professional and technical course work.

4. Safety education ranks third (after technical instruction and motivation) among the many tasks performed by vocational educators.

5. Laboratory and classroom instruction is the single most important safety program activity reported by the combined respondent group.

6. Safety testing and student evaluation were reported as the highest category of personal and program need by the combined group.

7 Personal protective equipment was identified by the combined group as being the most common standard that their program did not meet. Facility maintenance was a close second.

Deliverables generated by this project are numerous. They include:

1. the Vocational Safety Guide, 3300 copies.

2. the Final Report and its analyses.

3. a series of service area specific analyses prepared for each service area supervisor in the Division of Career and Adult Education.

4. a set of three lesson plans that contain the primary core of the guide.

5. a set of workshop transparencies suitable for briefing administrators and instructors as to the key features of the guide.

6. initial work towards mounting the core lessons on an Apple CAI (pilot) system. This will allow an exchange of discs with schools interested in securing a computer-assisted instruction program on the key features of the safety guide.

7. a resource collection of safety guides from other states, useful texts and other information, all packed in a traveling case.

Dissemination of the actual guides will occur by providing a copy to each person who provided the research team with assistance, the project advisory committee, and selected Division of Career and Adult Education personnel. Other distributions will occur by mail to selected comprehensive high schools, and to area vocational technical school directors. In person distribution will also be made by Career and Adult Education personnel and by the project staff at key sessions of the 1981 Missouri Vocational Association conference.

Recommendations

The research team's year of effort has resulted in considerable insight into the perceptions of Missouri's practitioners, supervisors, and its safety community. These contacts resulted in the research team's recommendations that:

1. service area supervisors review needs assessment data specific to their areas and develop plans commensurate with this information or alternatively to prioritize their extant program of work.

2. a series of in-service workshops be provided to vocational administrators for the purpose of introducing the guide and also to sensitize them to the critical aspects of safety that will require their direct attention.

3. service area specific workshops be offered, as coordinated by service area supervisors and perhaps the area's professional association, to instructors teaching in the area.

4. service area specific safety guides be developed by appropriate teams of practitioners. These guides could usefully include the areas' specific machines, safety tests and special considerations.

5. a statewide program on vocational educator liability be developed for the 1982 MVA conference.

6. systematic training be made available to vocational administrators, supervisors, and instructors to develop increased facility inspection competencies and sensitivities.

ATTACHMENTS

I. Procedures

Review of Literature

An extensive search of pertinent and informative material was undertaken, commencing with a computerized ERIC search in July 1980. Descriptor items included vocational education safety, accident prevention, liability, and safety programs.

Letters of inquiry and request were sent to various individuals, educational institutions and agencies regarding safety programs and safety education. In response, both state and institutional safety manuals dealing with vocational safety were forwarded to the research team.

Publications of U. S. Government agencies were also utilized. They included information and recommendations from Occupational Safety and Health Administration (OSHA) and the National Institute of Occupational Safety and Health (NIOSH).

Additional sources of information included materials available at the Ellis Library, Law Library, and Engineering Library at the University of Missouri-Columbia.

Advisory Council Input

An advisory council made up of professionals was established to guide the project to the successful achievements of its objectives. The advisory council members made valuable recommendations and together with the project staff, had the task of prioritizing safety needs in Missouri's vocational education.

The Division of Career and Adult Education and the Missouri Advisory Council on Vocational Education recommended experienced personnel for council positions, as did UMC faculty. The composition of the group is provided in Table IV.

Two advisory council meetings were held. Meetings agendas included discussion and input solicitation on:

- project overview and plans.
- safety guide design.
- needs assessment instruments, procedures, population, and sample.
- review of specific guide sections.
- recommendations for revisions.

Both meetings and correspondence with advisory council members proved fruitful and project objectives gradually came into focus and problems were resolved.

TABLE IV
PROJECT ADVISORY COMMITTEE

Ted Bach, Safety Specialist
Occupational Safety & Health Administration

David Baker, Assistant Professor
Agricultural Engineering
University of Missouri-Columbia

Miles Beachboard, Director
Programs for the Disadvantaged & Handicapped
Department of Elementary & Secondary Education

Ralph Bicknell, Regional Program Consultant
National Institute for Occupational Safety & Health

B. Eugene Brightwell, Supervisor
Industrial Arts
Department of Elementary & Secondary Education

Larry Case, Director
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Department of Elementary & Secondary Education

Yolanda Dolecki, Supervisor
Health Occupations Education
Department of Elementary & Secondary Education

Phyllis Herriage, Director
Home Economics Education
Department of Elementary & Secondary Education

Deigh Irwin, Director
Cooperative Industrial & Distributive Education
Department of Elementary & Secondary Education

Paul Kinder, Supervisor
School Laws
Department of Elementary & Secondary Education

Fred Linhardt, Supervisor
Industrial Education
Department of Elementary & Secondary Education

Charles Newman, Director
Business & Office Education
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Roger Sherman, Director
Secondary Education
Sikeston Public Schools

Jim Shoemaker, Director
Vocational Technical Education
Graff Area Vocational Technical School

Robert M. Taylor, Director
Health, Physical Education & Safety
Department of Elementary & Secondary Education

The final advisory council meeting dealt with the overview and critique of the safety handbook's rough draft. Those members present were placed in smaller critique groups where the manual was read and revised. Additions, deletions, and satisfactory information were noted.

Each member's expertise and experience added to the guide's thorough coverage on the topic of safety and safety education.

Development of the Needs Assessment

In order to identify the safety needs of Missouri vocational instructors and administrators, it was necessary to develop an instrument which would provide such information. A review of the literature which was compiled by the research staff revealed specific areas of safety important to the development of a comprehensive safety program for vocational education. These were then developed into the original needs assessment instrument. A pilot study using this instrument was then conducted by mailing to fifty vocational instructors randomly selected from each service area. The pilot was also mailed to all members of the advisory committee for their critique.

The purpose of the pilot was to improve the instrument by incorporating the comments from the instructors sampled and the advisory committee and to give guidance to the initial guide development. All comments were taken into consideration and the final draft of the instrument was then developed. Approval of the instrument was received from the Research Coordinating Unit and the initial mailing took place on March 6, 1981. The final instrument is provided in Appendix A.

Information regarding the population and sample for whom the needs assessment was developed is found in the previously provided Tables I and II. The characteristics of the respondents (53%) were presented in Table III.

Table V presents the results of the needs assessments sections. It shows the respondents' ranking of safety as compared to other major educational tasks. Service area breakouts are also depicted. Table VI provides a similar ranking and analysis but this time it shows the relative importance of tasks that are necessary to provide for the safety of vocational students.

The needs assessment also generated specific instructor and administrator rankings and indicators of personal and program needs for each major category and item of concern in a comprehensive safety program. Table VII provides these data for the combined group responses. Note that:

1. the numbers in the column preceding each safety item refer to the group's ranking of the importance of that item as compared to others within the same major category (indicated by letter).

2. the members in each major category's title row (lettered and capitalized) refer to the average response to all the separate items listed as part of the major category.

TABLE V
RESPONDENT RANKINGS OF THE IMPORTANCE OF
VARIOUS EDUCATIONAL TASKS

	Grand Mean (combined group)	Marketing & Distributive	Home Economics	Agricultural	Trade & Technical	Industrial Arts	Health Occupations	Business & Office	Administrators (combined)
Instruction of technical knowledge and skill (E)	7.4	7.5	7.5	5.9	7.5	7.1	8.8	8.5	7.5
Develop student motivation and interest (F)	7.2	7.8	7.9	6.9	7.1	6.8	7.7	7.9	6.6
Provide for student (classroom/shop/laboratory) safety (D)	6.7	3.6	5.6	7.4	6.9	8.0	5.1	4.8	7.4
Developing student attitudes toward work and the subject studied (I)	6.7	8.0	6.6	6.2	6.9	7.3	6.6	7.3	6.5
Discipline and student control (in and out of class) (A)	6.4	5.4	5.5	8.2	5.4	7.4	4.3	4.9	7.1
Curriculum development (courses of study, lesson plans, etc.) (C)	6.2	5.6	6.9	5.7	6.3	5.6	7.6	6.9	6.0
Counseling/advising/guiding students (J)	4.3	6.0	4.8	4.3	4.6	3.9	4.8	4.2	3.8
Evaluating and grading of student performance (G)	4.2	5.1	4.4	2.6	4.3	3.7	5.2	4.8	4.2
Equipment and facility maintenance, housekeeping, etc. (H)	4.0	2.8	3.4	4.3	4.4	5.1	2.2	3.6	4.1
Participate in vocational youth organization activities (B)	2.4	3.3	2.6	3.5	2.3	1.3	2.6	1.8	2.3

Means have been rounded and totals may not add due to some missing values in service area analyses.

TABLE VI
RESPONDENT RANKINGS OF THE IMPORTANCE OF
VARIOUS SAFETY PROGRAM TASKS

	Grand Mean (combined group)	Marketing & Distributive	Home Economics	Agricultural	Trade & Technical Industrial Arts	Health Occupations	Business & Office	Administrators (combined)
Laboratory and classroom instruction & demonstration of safety precautions/safe procedures (E)	6.6	5.8	7.2	6.6	6.2	6.7	7.2	6.6	6.5
Providing personal protective equipment (eye, clothing, etc.) (B)	5.0	3.9	2.8	6.0	4.8	5.8	4.3	2.9	5.6
Safety testing/ evaluation of students (C)	4.7	4.9	3.0	4.9	4.9	5.3	4.6	3.5	5.0
Providing machine guards, barriers, interlocks, etc. (A)	4.6	3.7	3.0	5.5	4.4	5.4	3.4	3.5	5.1
Safety inspection of facilities & equipment (F)	4.1	3.9	4.5	4.3	4.3	3.7	3.5	4.7	4.1
Arranging equipment for safety (G)	4.1	4.2	5.5	3.4	4.2	3.5	4.6	5.9	3.6
Developing emergency procedures & making students aware of them (D)	3.8	5.6	4.8	2.5	4.5	2.6	5.5	4.7	3.4
Establishing safe storage & working facilities (e.g., fire protection, walkways, electrical) (H)	3.3	4.5	5.3	2.9	3.0	2.9	3.5	4.6	2.8

Means have been rounded and totals may not add due to some missing values in service area analyses.

TABLE VII
COMBINED GROUP REPORTS OF RELATIVE IMPORTANCE AND THE
DEGREE OF PERSONAL AND PROGRAM NEEDS

		Personal Needs	Program Needs
A.	MACHINES AND EQUIPMENT	1.92	1.90
2	Use of machine guards	1.88	1.89
3	Grounding and electrical safety	1.94	1.84
1	Machine operating procedures	2.00	1.90
5	Equipment location, anchoring & space requirements	1.91	1.97
4	Hand tool and portable power equipment usage	1.83	1.93

		Personal Needs	Program Needs
B.	PERSONAL PROTECTIVE EQUIPMENT	1.89	1.93
1	Face and eye protection	1.95	2.05
2	Head and ear protection	1.86	1.94
4	Hand, foot, leg protection	1.76	1.85
3	Respiratory protection	2.05	2.11

		Personal Needs	Program Needs
C.	SAFETY TESTING/STUDENT EVALUATION	2.13	2.04
2	Student safety knowledge test	2.11	2.03
1	Student demonstration of proficient use of equipment	2.11	2.04

		Personal Needs	Program Needs
D.	EMERGENCY PROCEDURES	1.93	1.97
2	Posting information (telephone numbers, evacuation routes, etc.)	1.82	1.81
1	Providing emergency materials and/or equipment, e.g., first aid kits	2.05	2.11

		Personal Needs	Program Needs
E.	LABORATORY INSTRUCTION & DEMONSTRATION	1.92	1.90
1	Teaching safety as an integral part of each instructional unit and/or job	2.04	2.00
4	Posting safety regulations and providing printed safety rules to each student	1.84	1.93
2	Supervising use of machines and tools	1.95	1.92
5	Establishing emergency procedures and training students in the use of fire extinguishers	1.85	1.86
3	Developing positive safety habits by providing students experience in applying safety practices	1.97	1.97
6	Student operation of vehicles	1.66	1.72

		Personal Needs	Program Needs
F.	SAFETY INSPECTIONS/FACILITIES EQUIPMENT	1.93	1.92
1	Sources, types, scheduling of inspection	1.94	1.90
2	Inspections of job training sites	1.91	1.89

		Personal Needs	Program Needs
G.	HOUSEKEEPING AND MAINTENANCE	1.86	1.96
4	Custodial service and waste removal	1.70	1.86
3	Materials storage and labeling of bins/containers, etc.	1.87	2.05
2	Walkways and work areas free of all obstructions	1.72	1.87
1	Preventative maintenance	2.09	2.12

		Personal Needs	Program Needs
H.	FACILITIES AND EQUIPMENT	1.90	1.97
3	Materials storage	2.03	2.25
2	Fire protection equipment	1.86	1.87
7	Safety markings and signs	1.88	2.01
1	Ventilation and noise control	2.04	2.21
6	Walking/working surfaces	1.76	1.80
5	Lighting	1.81	1.79
4	Electrical (switches, panels, outlets)	1.89	1.94

3. the numbers listed in the personal needs column indicate the respondents' report of the degree of need they personally felt for that item.

4. the numbers listed in the program needs column indicate the respondents' perceptions of the degree of need for attention to that item on the part of the school, facility, and/or program.

5. all items in the personal and program needs column were rated 3 to 1 with 3.0 indicating a high need.

This study also attempted to identify the extent to which existing facilities meet major safety criteria. Table VIII provides a report of these findings by service areas and also by combined group.

Correlations among the various personal and situational characteristics, as originally provided in Table III, and the various degrees of need on major categories of safety concerns are presented in Table IX.

Finally, Table X depicts the analysis of degree of need, both personal and program, as reported by various service area respondents. Note that Health Occupations personnel report the highest personnel needs and administrators the highest program needs.

Writing of the Guide

In order to thoroughly cover safety in vocational education, an outline for the safety manual was developed by the research team. With input from the advisory council this systematic study of important safety areas resulted in an outline of topics that were deemed both necessary and practical.

Each member of the research team was assigned specific sections of the outline to investigate. Research included telephone and personal contact, letter writing as well as a review of printed materials.

The collection of safety manuals from other states and agencies were reviewed for information as relevant to each proposed section of the guide. Copies were made of this information, highlighted and filed for further use, particularly in footnoting. The writing process was then under way with each team member developing a specific section.

After the first rough draft was generated, a review-and-comment session was scheduled with the advisory council. Suggestions were made by the members as to the needs of each section and careful records were kept. The team, in response to these recommendations, continued to build and shape the safety guide. Subsequently each section was carefully edited for smoothness and clarity and then the guide was reorganized to be maximally useful for the practitioner.

TABLE VIII

PERCENT OF VOCATIONAL LABORATORIES MEETING DESCRIBED SAFE CONDITIONS AS PERCEIVED BY RESPONDENTS

		Health Occupations	Industrial Arts	Business & Office	Administrators	Agricultural	Trade & Technical	Home Economics	Marketing & Distributive	Combined Group
Machinery & Machinery Guarding For example: Machinery properly mounted & anchored; appropriate guards are in place; all electrical machinery is effectively grounded; machines are appropriately adjusted; etc.	YES	60	72	62	77	63	77	61	33	69
	NO	6	27	16	22	37	9	22	0	20
	NA	34	1	22	1	0	14	17	66	11
Personal Protective Equipment For example: Protective clothing; eye & face protection; ear plugs &/or muffs; respirators; foot protection; hand protection; head protection; etc., are all appropriately available & are in good condition.	YES	40	52	17	63	38	52	25	0	47
	NO	0	43	10	35	62	23	14	22	30
	NA	60	4	73	2	0	25	61	78	24
Facility Maintenance For example: Rest rooms & wash rooms in sanitary condition; overhead storage provided with guard rails; proper color coding; spray-painting booths provided; proper arrangement of equipment; daily housekeeping; evacuation routes defined; fire extinguishers are located in lab & classroom; etc.	YES	69	67	45	64	48	77	69	50	63
	NO	14	28	39	35	50	15	22	6	29
	NA	17	5	16	1	2	8	8	44	8
Electrical Equipment Condition For example: Power hand tools are double insulated or grounded; electric cords in good condition; grounded electrical outlets; electric junction boxes are covered; fuse box circuits are labeled properly; welding cables in good condition; power appliances or machines are grounded; adequate number of outlets.	YES	49	77	35	73	71	74	53	33	65
	NO	11	22	39	25	29	20	33	0	24
	NA	40	1	26	1	0	6	14	66	11
Tools & Equipment Condition For example: Mushroomed heads on chisels, punches, etc. have been reconditioned or replaced; broken handles in hammers, shovels, etc. have been replaced; filing cabinet drawers have secure handles; cleaning air pressure does not exceed 30 PSI; scissors & knives are sharp; worn or bent wrenches have been replaced; ladders in good condition; deteriorated air hoses have been replaced, etc.	YES	43	75	32	79	71	70	54	29	65
	NO	9	22	13	20	29	18	20	12	20
	NA	49	3	55	1	0	12	26	59	15

Percentages are rounded to nearest percent

TABLE IX

PEARSON CORRELATION OF PERSONAL AND PROGRAM NEED WITH YEARS TAUGHT AND WORK EXPERIENCE

	Personal Need	Program Need	Years Taught	Work Experience
Personal need				
Program need	.74828* (N = 410)			
Years taught	.04725 (N = 412)	.00826 (N = 410)		
Work experience	.03848 (N = 410)	.03469 (N = 408)	.08018 (N = 440)	

*Significant at .0001

TABLE X
REPORTED PERSONAL AND PROGRAM NEEDS BY SERVICE AREAS

Program Needs		Personal Needs	
Administrators	2.01	Health Occupations	2.00
Agricultural	1.99	Industrial Arts	1.99
Industrial Arts	1.95	Administrators	1.94
Trade & Technical	1.89	Agricultural	1.91
Health Occupations	1.87	Trade & Technical	1.89
Home Economics	1.82	Home Economics	1.76
Business & Office	1.80	Business & Office	1.67
Marketing & Distributive	1.48	Marketing & Distributive	1.61

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APPENDIX A

SAFETY NEEDS ASSESSMENT
(Final Version)

UNIVERSITY OF MISSOURI-COLUMBIA

College of Education

Practical Arts and Vocational Technical Education

Industrial Education
103 Industrial Education
Columbia, Missouri 65201 6521
Telephone: (314) 882-3082

February 26, 1981

TO: Selected Missouri Vocational Educators

FROM: Michael J. Dyrenfurth and Richard Linhardt
Principal Investigators, Vocational Safety Handbook Project

A project funded by Missouri's Career and Adult Education Division
as a service to all vocational educators

The purpose of this request is to have you tell us what you need! Our project will place in your schools a safety handbook that will assist you to provide for the safe instruction of vocational subjects. Furthermore, the handbook will provide guidelines that can minimize the likelihood of possible negligence should unfortunately one of your students be hurt.

Now, please note the enclosed survey. It is vitally necessary because it will enable us to tailor the guide to your needs! Additionally, your responses will serve to alert state officials to the nature of Missouri's most urgent safety needs . . . as seen by practitioners such as yourself. Vocational educators in each instructional area have been asked to respond. However, because surveys are expensive the sample is small but representative. Therefore, your response is all the more important.

Please help us, and the Missouri Division of Career and Adult Education, help you teach more safely. Please take a few minutes today and complete the enclosed survey. There are no hidden agendas. We just need to know what safety information and assistance practitioners feel they need the most. Then, return the survey to us in the self-addressed postage-paid envelope.

All responses are strictly confidential. No report or Career and Adult Education staff member will identify either you or your school. The surveys are however coded to allow us to follow up non-respondents.

Thank you in advance for your willingness to contribute to the further development of vocational education in Missouri.

MJD/RL/pl

Enclosures

an equal opportunity institution

"The activity which is the subject of this questionnaire is supported in whole or in part by funds from the Department of Elementary and Secondary Education, Division of Career and Adult Education. However, the opinions expressed herein do not necessarily reflect the position or policies of the Missouri Department of Elementary and Secondary Education or the Division of Career and Adult Education and no official endorsement should be referred."

SAFETY NEEDS ASSESSMENT FOR VOCATIONAL EDUCATION

ALL INFORMATION IS CONFIDENTIAL

NO USE OF THE DATA WILL IDENTIFY A SPECIFIC SCHOOL OR INDIVIDUAL

I. The following is a list of ten activities that represent tasks performed by vocational education teachers. Please identify the items according to their overall importance by giving a 1 to the most important activity, a 2 to the next most important, a 3 to the next and on to 10.

____ A. Discipline and student control (in and out of class).

____ B. Participate in vocational youth organization activities.

____ C. Curriculum development (courses of study, lesson plans, etc.).

____ D. Provide for student (classroom/shop/laboratory) safety.

____ E. Instruction of technical knowledge and skill.

____ F. Develop student motivation and interest.

____ G. Evaluating and grading of student performance.

____ H. Equipment and facility maintenance, housekeeping, etc.

____ I. Developing student attitudes toward work and the subject studied.

____ J. Counseling/advising/guiding students.

II. The following list represents activities that instructors deal with in order to insure the safety of students and to guide them towards the development of good safety habits. Please rank in order (from 1 to 8) these activities in terms of their importance to this objective.

____ A. Providing machine guards, barriers, interlocks, etc.

____ B. Providing personal protective equipment (eye, clothing, etc.).

____ C. Safety testing/evaluation of students.

____ D. Developing emergency procedures and making students aware of them.

____ E. Laboratory and classroom instruction and demonstration of safety precautions/safe procedures.

____ F. Safety inspection of facilities and equipment.

____ G. Arranging equipment for safety.

____ H. Establishing safe storage and working facilities (e.g., fire protection, walkways, electrical).

III. Each of the following lettered sections represents one major unit of an overall safety program. Listed under each section is a set of topics that make up each unit.

1. Within each unit please rank (1 is always most important) all topics according to their overall importance to a safety program. Place this rank in the space just before the topic.
2. Place a check (✓) in one of the Personal Need columns (just to the right of the topic) to indicate the degree of need you personally have for more information on the topic.
3. Place a check (✓) in one of the Program Need columns (to the far right of the topic) to indicate the degree of need you have for dollars, equipment, or materials for your program in order to implement proper safety precautions.
4. If any item does not apply to your area, check the NA column.

EXAMPLE

		Personal Needs				Program Needs			
X.	UTILIZING NATIONAL, STATE, LOCAL AGENCIES	High	Med	Low	NA	High	Med	Low	NA
1	NIOSH	✓							✓
3	National Safety Council			✓			✓		
2	State Department of Education		✓					✓	

		Personal Needs				Program Needs			
A.	MACHINES AND EQUIPMENT	High	Med	Low	NA	High	Med	Low	NA
	Use of machine guards								
	Grounding and electrical safety								
	Machine operating procedures								
	Equipment location, anchoring & space requirements								
	Hand tool and portable power equipment usage								

		Personal Needs				Program Needs			
B.	PERSONAL PROTECTIVE EQUIPMENT	High	Med	Low	NA	High	Med	Low	NA
	Face and eye protection								
	Head and ear protection								
	Hand, foot, leg protection								
	Respiratory protection								

		Personal Needs				Program Needs			
C.	SAFETY TESTING/STUDENT EVALUATION	High	Med	Low	NA	High	Med	Low	NA
	Student safety knowledge test								
	Student demonstration of proficient use of equipment								

		Personal Needs				Program Needs			
D.	EMERGENCY PROCEDURES	High	Med	Low	NA	High	Med	Low	NA
	Posting information (telephone numbers, evacuation routes, etc.)								
	Providing emergency materials and/or equipment, e.g., first aid kits								

PLEASE REMEMBER TO:

1. Rank all items in each unit | 2. Rate extent of personal needs | 3. Rate extent of program needs

		Personal Needs				Program Needs			
E.	LABORATORY INSTRUCTION & DEMONSTRATION	High	Med	Low	NA	High	Med	Low	NA
	Teaching safety as an integral part of each instructional unit and/or job								
	Posting safety regulations and providing printed safety rules to each student								
	Supervising use of machines and tools								
	Establishing emergency procedures and training students in the use of fire extinguishers								
	Developing positive safety habits by providing students experience in applying safety practices								
	Student operation of vehicles								

		Personal Needs				Program Needs			
F.	SAFETY INSPECTIONS/FACILITIES EQUIPMENT	High	Med	Low	NA	High	Med	Low	NA
	Sources, types, scheduling of inspection								
	Inspections of job training sites								

		Personal Needs				Program Needs			
G.	HOUSEKEEPING AND MAINTENANCE	High	Med	Low	NA	High	Med	Low	NA
	Custodial service and waste removal								
	Materials storage and labeling of bins/containers, etc.								
	Walkways and work areas free of all obstructions								
	Preventative maintenance								

		Personal Needs				Program Needs			
H.	FACILITIES AND EQUIPMENT	High	Med	Low	NA	High	Med	Low	NA
	Materials storage								
	Fire protection equipment								
	Safety markings and signs								
	Ventilation and noise control								
	Walking/working surfaces								
	Lighting								
	Electrical (switches, panels, outlets)								

IV. The lettered items listed below represent major facets in a total safety program. Under each item are examples of safe conditions which you would expect to find in your program. Note, in some way, each major facet can apply to any vocational service area. In some instances you may have to substitute appliance for machine to fit your vocational area.

Place a check (✓) in the TRUE column if your laboratory does meet the described safe conditions in any significant manner. Place a check (✓) in the FALSE column if your laboratory does not meet the described safe conditions in any significant manner.

Please check the DOES NOT APPLY box only if you cannot construe any meaningful application of the safety facet to your instructional area.

For my teaching situation this is essentially:

A. Machinery and machine guarding — True ☐ False ☐ Does not apply ☐

For example: Machinery properly mounted and anchored; appropriate guards are in place; all electrical machinery is effectively grounded; machines are appropriately adjusted; etc.

B. Personal protective equipment meets specifications and is properly maintained — True ☐ False ☐ Does not apply ☐

For example: Protective clothing; eye and face protection; ear plugs and/or muffs; respirators; foot protection; hand protection; head protection; etc., are all appropriately available and are in good condition.

C. Facilities are maintained to promote optimum safety conditions — True ☐ False ☐ Does not apply ☐

For example: Rest rooms and wash rooms in sanitary condition; overhead storage provided with guard rails; proper color coding; spray painting booths provided; proper arrangement of equipment; daily housekeeping; evacuation routes defined; fire extinguishers are located in lab and classroom; etc.

D. Electrical equipment and controls are in proper condition — True ☐ False ☐ Does not apply ☐

For example: Power hand tools are double insulated or grounded; electric cords in good condition; grounded electrical outlets; electric junction boxes are covered; fuse box circuits are labeled properly; welding cables in good condition; power appliances or machines are grounded; adequate number of outlets.

E. Tools and equipment are in good operating condition — True ☐ False ☐ Does not apply ☐

For example: Mushroomed heads on chisels, punches, etc., have been reconditioned or replaced; broken handles in hammers, shovels, etc., have been replaced; filing cabinet drawers have secure handles; cleaning air pressure does not exceed 30 PSI; scissors and knives are sharp; worn or bent wrenches have been replaced; ladders in good condition; deteriorated air hoses have been replaced, etc.

V. Descriptive Information

A. Type of school or institution you work in:

____ Middle school/junior high ____ Comprehensive high school

____ Area vocational-technical school/center ____ Junior/community college

____ Other (explain)_____

B. Titles of courses taught or present position:_____

_____

C. How many years have you taught vocational education (including industrial arts)?_____

D. How many years of work experience (other than teaching) relevant to your teaching assignment do you have?_____

E. Please circle the highest degree/certificate held:

Non-degree Working toward degree/certificate

Bachelor's Master's

Specialist Doctorate

F. Have you had cardiopulmonary resuscitation (CPR) training?_____

G. Have you been certified in first aid by Red Cross in the last three years?

_____

H. Have you had any other safety training?_____
If so, please explain._____

_____

I. Have you had any accidents (defined as any physical injury requiring more than first aid treatment by a physician) in your program in the last five years?_____ If yes, please briefly describe the type of injury, cause, and consequences.

_____

_____

_____

J. Comments concerning the survey or safety are welcomed:

_____ _____

_____

_____

_____